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To: [Rockett, Derek \(ECY\)](#); [Rockett, Derek \(ECY\)](#); [Doenges, Rich \(ECY\)](#); [jackie_ferrier@fws.gov](#); [glynnis_nakai@fws.gov](#); [Landskron, Jason \(ECY\)](#); [Rogowski, Barry \(ECY\)](#); [scott.anderson@noaa.gov](#); [thomas.hooper@noaa.gov](#); [PALAZZI, DAVID \(DNR\)](#); [opoysters@msn.com](#)
Cc: [Ryan McReynolds](#)
Subject: USFWS Letter: WDOE Shrimp Management
Date: Monday, December 08, 2014 2:10:02 PM
Attachments: [WDOE Shrimp.pdf](#)

I am sending the attached document on behalf of Ryan McReynolds of the U.S. Fish and Wildlife Service.

Neil Quackenbush
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United States Department of the Interior

FISH AND WILDLIFE SERVICE

Washington Fish and Wildlife Office
510 Desmond Dr. SE, Suite 102
Lacey, Washington 98503



DEC - 8 2014

In Reply Please Refer To:
01EWF00-2012-CPA-0080

Washington State Department of Ecology
Water Quality Program
ATTN: D. Rockett
P.O. Box 47775
Olympia, Washington 98504-7775

Dear Mr. Doenges and Dear Ms. Bartlett:

On October 24, 2014, the Washington State Department of Ecology (Ecology) Aquatic Pesticide Permits program announced its intent to issue a National Pollutant Discharge Elimination System (NPDES) and State Waste Discharge permit to the Willapa-Grays Harbor Oyster Growers Association (WGHOGA) addressing the use and application of the aquatic pesticide imidacloprid to control burrowing shrimp (ghost shrimp, *Neotrypaea californiensis*; mud shrimp, *Upogebia pugettensis*) on commercial shellfish beds in Willapa Bay and Grays Harbor, Washington. Ecology has prepared a Draft Environmental Impact Statement (EIS), fact sheet, draft individual permit (Permit No. WA0039781), and public notices and applications for proposed Sediment Impact Zones (SIZs) in Willapa Bay and Grays Harbor, and has made these documents available for public review and comment. The public comment period closes on December 8, 2014.

Thank you for the opportunity to comment and express our concerns regarding this proposal. If you or your staff have any questions, or if our comments require further explanation, please contact the staff and/or manager identified at the close of this letter.

Control of Burrowing Shrimp with Imidacloprid

The WGHOGA has submitted a NPDES permit application, and has requested permit coverage, for the control of burrowing shrimp on commercial shellfish beds (oyster and clam) located in Willapa Bay and Grays Harbor with the aquatic pesticide imidacloprid. Imidacloprid is a systemic insecticide, belonging to the class of synthetic chemical compounds known as neonicotinoids, and acts as an insect neurotoxin. The compound interferes with the transmission of stimuli in the insect nervous system, causes blockages in neuronal pathways, and accumulation of the neurotransmitter acetylcholine, resulting in paralysis and/or death.

The two varieties of burrowing shrimp found in Willapa Bay and Grays Harbor, ghost shrimp (*N. californiensis*) and mud shrimp (*U. pugettensis*), are each native to these waters. As their name implies, burrowing shrimp rework intertidal and shallow subtidal bottom sediments during the normal course of their feeding, sheltering, and other activities (bioturbation). “Although they have no importance as a food item for human consumption ... burrowing shrimp play an important role in ecosystem processes and often are a dominant component of the benthic community ... [they] influence benthic species composition ... [and] are prey for a number of species ... as such, [burrowing shrimp] are an important link in estuarine trophic pathways” (Feldman *et al.* 2000, pp. 145, 153, 166).

The WGHOGA contends, where burrowing shrimp are present in high density and in significant numbers, their natural tendency to rework bottom sediments creates substrate conditions that make it difficult to economically farm oysters and clams. Since the 1960s, farm operators in Willapa Bay and Grays Harbor have applied carbaryl (1-naphthol n-methyl carbamate) to control burrowing shrimp on commercial shellfish beds. The practice has long been contentious for reasons that have been discussed in detail elsewhere (Feldman *et al.* 2000). According to documents posted to Ecology’s Aquatic Pesticide Permits program website (Ecology 2008; WDOE Permit No. WA0040975 - Expiration Date: June 30, 2011), there is no current, valid permit for the application of carbaryl to commercial shellfish beds in Willapa Bay or Grays Harbor.

The WGHOGA and their research partners have obtained a federal registration and Experimental Use Permit (under the Federal Insecticide, Fungicide, and Rodenticide Act) for the application of imidacloprid to control burrowing shrimp on oyster beds. Since 2008, the WGHOGA and their research partners have been conducting limited field trials evaluating fate and transport, efficacy, persistence, and effects to non-target organisms, generally on beds of less than 20 acres (treated and un-treated, control sites)(D. Rockett, pers. comm. 2014).

General Comments

Imidacloprid is off patent and is used widely and ubiquitously. There is new scientific evidence documenting the prevalence of neonicotinoids, their persistence within natural systems, and the adverse effects of neonicotinoids in general, and imidacloprid specifically, on non-target invertebrate and vertebrate species, and ecosystem functions (Mason *et al.* 2013; Van Dijk *et al.* 2013; Chagnon *et al.* 2014; Hallmann *et al.* 2014; Hladik *et al.* 2014; Van Lexmond *et al.* 2014). The U.S. Fish and Wildlife Service (Service) does not support Ecology’s preferred alternative (Alternative 3), Imidacloprid Applications with Integrated Pest Management (IPM). We do not support the issuance of an individual NPDES permit at this time. We oppose the authorization of Sediment Impact Zones (SIZs) in Willapa Bay and Grays Harbor.

The Service does not support Alternative 2, Carbaryl Applications with IPM. Carbaryl applications have been the cause for unacceptable damage to Service trust resources. Ecology and the industry have been planning to discontinue the practice of applying carbaryl to commercial shellfish beds. We believe that there is a sound scientific basis for concluding that carbaryl applications should be discontinued entirely.

The Service instead offers its support for Alternative 1, the No Action Alternative. Ecology, the WGHOGA, and their research partners acknowledge that the limited field trials performed to date have failed to meaningfully and adequately address a number of outstanding issues and concerns regarding fate and transport, efficacy, persistence, and effects to non-target organisms (Ecology 2014, pp. 1-33 through 1-37).

According to Ecology (Ecology 2014, pp. 1-33 through 1-37), these outstanding issues and unresolved questions include 1) the majority of data regarding the effects of imidacloprid have been obtained from studies performed in terrestrial agriculture applications and/or within laboratory settings, 2) the results of multi-year studies are not yet available to affirm whether imidacloprid and its primary metabolites accumulate in sediments, 3) there is uncertainty whether imidacloprid may have potential long term sediment toxicity effects on benthic and free-swimming invertebrate communities, and the species that utilize them as food sources, 4) there is uncertainty whether the results of experimental trials correlate directly when the spatial extent of the treatment area is increased under the NPDES permit, 5) a well-defined method for determining the treatment threshold to ensure efficacy has not yet been formulated, 6) it is not yet known whether the target species may become resistant to the effects of imidacloprid over time, 7) the effects of imidacloprid on zooplankton species are largely unstudied and the potential for direct mortality of planktonic juvenile crustaceans is unknown, 8) limited information from marine environments is available regarding the possible sub-lethal effects of imidacloprid on non-target organisms, 9) limited data are available regarding the toxicity and persistence of imidacloprid degradation products, and, 10) a limited number of field studies have been conducted in the estuarine environment. "It is not known with certainty whether off-plot movement of imidacloprid and/or its degradation products ... may have [effects] nearby ... On-going studies at the time of this writing are evaluating off-plot movement."

The documentation prepared by Ecology and the WGHOGA does not convincingly demonstrate that the proposed permit and SIZs can be issued/authorized while still ensuring that greater than "minor" adverse effects will be fully avoided. Until field trials have adequately addressed the many unresolved questions, and to the satisfaction of all interested stakeholders, we recommend to Ecology that they should continue limited field trials under the Experimental Use Permit. The Service acknowledges that continuing a program of limited field trials would improve the state of our knowledge regarding imidacloprid applications and effects in the estuarine and marine environments.

Specific Comments for the Draft EIS (Ecology 2014)

- (Cover Memo). The stated primary objective is control of burrowing shrimp on commercial shellfish beds. With our previous letter to Ecology, when offering scoping comments (Letter to Donald A. Seeberger, dated February 14, 2014), the Service recommended that the EIS and permit framework should give fair and equal consideration to alternate culturing methods and practices. Control and removal of a native species that performs important ecological functions should not be the primary objective. Instead, this effort should be directed at developing and refining robust IPM methodologies that adaptively manage shellfish production systems to avoid harming ecological resources.

- (Page vi). “At the time of this writing ... there are no known alternatives to chemical applications to effectively control burrowing shrimp.” COMMENT - The stated primary objective is flawed. Other alternatives should be given fair and equal consideration, including alternate culturing methods and practices, and a robust IPM methodology with stricter limits on the use of chemical control agents.
- (Page 1-3). “With low burrowing shrimp recruitment over the past ten years or so, it has been possible to farm some ... beds without shrimp control. However, due to the recent large recruitments of burrowing shrimp in Willapa Bay and Grays Harbor, growers are now seeing high shrimp densities in substrate without distinction by crop.” COMMENT - Ecology and the WGHOGA acknowledge that burrowing shrimp numbers and densities exhibit cyclical changes over time. There is little or no evidence to substantiate the claims that Willapa Bay and Grays Harbor are currently experiencing anything unusual related to burrowing shrimp recruitment, numbers, abundance, and densities.
- (Page 1-6). The documentation prepared by Ecology and the WGHOGA refers repeatedly to a single metric or measure of efficacy: Is the practice or treatment sufficient to reduce numbers below the “damage threshold” of ten burrows per square meter? The documentation provides little information to describe where this damage threshold originated, who developed the threshold, and how it is justified. The damage threshold is presented as a given and there is no effort to evaluate whether it is valid and appropriate for its intended purpose. In this sense, the proposed IPM methodology is arbitrary.
- (Page 2-35). “Additional field trials were conducted during summer 2014 ... If the results of these studies are available, they will be reported in the Final EIS.” COMMENT - The 2014 field trials include the first treatment sites larger than 30 acres, target collection of information from sites where the substrate has a high organic content (influencing persistence), and address deficiencies stemming from earlier work conducted without an approved data sampling and analysis plan (D. Rockett, pers. comm. 2014). The National Marine Fisheries Service has requested that Ecology provide results from the 2014 field trials when they become available (T. Hooper, pers. comm. 2014); to date, Ecology has not provided this information.
- (Page 2-35). Ecology should not advance a permit decision until more data is collected (during 2014 and 2015) and shared with the public. A decision to issue the permit and authorize SIZs while relevant and important data remain unavailable would be premature. Ecology should not advance the permit decision until they have fully addressed and can be responsive to science-based concerns regarding fate and transport, efficacy, persistence, and effects to non-target organisms. We recommend to Ecology that the work made possible by the Experimental Use Permit should continue.
- (Pages 2-47 through 2-56). Alternatives considered and Eliminated from Detailed Evaluation. Ecology and the WGHOGA document alternative mechanical, physical, and chemical control methods, and describe alternative culturing systems. Many of these

practices are flawed in principle and have little or no merit. Others do have merit but were eliminated because they are not economically feasible on relevant spatial scales. However, graveling and frosting are established practices with the specific goal of firming substrates and fostering good conditions for larval attachment, maturity, and growth. Graveling and frosting should have a role in IPM methodologies directed at successful shellfish culturing on tidelands affected by burrowing shrimp. Long-line and stake culturing are also established practices, and are used successfully by some growers and farm operators in these same portions of Willapa Bay and Grays Harbor. Much of the information used to discredit these practices appears to be anecdotal and not based on either scientific studies or rigorous and comparative evaluation. Ecology and the WGHOGA should address more seriously and objectively whether methods of ground-based culturing and production require reevaluation in light of new science and the many concerns related to aquatic pesticide applications. Chemical control methods with lethal and biologically significant sub-lethal effects to non-target organisms should be a last resort and only implemented after a robust IPM methodology has exhausted all other alternatives at each specific location.

- (Page 2-55). A variety of native, biologically and economically important species prey on burrowing shrimp, including smelt (family Osmeridae), herring (family Clupeidae), chum salmon (*Oncorhynchus keta*), surfperch (family Embiotocidae), flounder (family Pleuronectidae), cutthroat trout (*O. clarki*), white and green sturgeon (*Acipenser transmontanus*, *A. medirostris*), and Dungeness crab (*Metacarcinus magister*). “Both the green and white sturgeon ... [feed] on burrowing shrimp ... 40 to 50 percent of the organisms by number and weight ... [found in green sturgeon stomach contents] were burrowing shrimp (Dumbauld et al. 2008).” As far as we know, there is no scientific information supporting Ecology’s claim that “...sturgeon generally do not feed on shellfish beds.”
- (Pages 2-57 and 2-58). Here and elsewhere, Ecology and the WGHOGA have repeated claims that without chemical control of burrowing shrimp there will be “...increased burrowing shrimp activity; reduction in eelgrass growth and density; and reduced biodiversity, which could lead to a reduction in the presence of birds, fish, and other species that feed on organisms that inhabit eelgrass.” Ecology and the WGHOGA claim that Alternative 3 (Imidacloprid Applications with IPM) would “...have beneficial environmental effects in the form of preserving the substrate and biodiversity of commercial shellfish beds, and promoting native eelgrass density and coverage, thereby improving foraging habitat and prey diversity for birds and fish, and cover for juvenile fish including ... salmonids.” COMMENT - The Service does not agree that these claims are justified or established in fact. These claims are misleading, especially in light of the WGHOGA current practice of removing both native and non-native eelgrasses (*Zostera marina* and *Z. japonica*, respectively) where they complicate shellfish production.
- (Pages 2-58 through 2-60). With our previous comment letter to Ecology (Letter to Donald A. Seeberger, dated February 14, 2014) the Service stated that we do not support large scale chemical treatment of mixed native and non-native eelgrass beds, and that permits proposed for issuance by Ecology do not adequately address mitigation for

collateral damage to non-target vegetation. We expect that these chemical control practices will cause significant damage to native flora and fauna, including damage that extends off of the treated beds and sites.

- (Page 2-61). Ecology and the WGHOGA claim that if burrowing shrimp are not controlled they will "...proliferate unmanaged, with likely unrecoverable damage ... [causing] significant alterations to the bay-wide ecosystem." COMMENT - Burrowing shrimp are native and perform important ecological functions in these systems. As such, they do not represent an alteration of the bay-wide ecosystem. However, chemical control methods do represent an intrusive alteration, and may have unintended consequences.
- (Page 3-13). "Based on currently available information and studies, and requirements to comply with the conditions of all applicable pesticide registrations, permits, and regulations (including the Washington State Water Quality Standards and SMS), no significant unavoidable adverse impacts to sediments would be expected with the proposed action (Alternative 3: imidacloprid applications with IPM), or with Alternative 2 (carbaryl applications with IPM)." COMMENT - The Service does not agree that this conclusion is accurate or justified.
- (Page 3-24). "A SIZ is the area where the applicable State sediment quality standards of WAC 173-204-320 through 173-204-340 are exceeded due to ongoing permitted or otherwise authorized wastewater, storm water, or nonpoint source discharges (WAC 173-204-200)." COMMENT - The threshold criterion for "minor" adverse effects to sediments and benthos are not adequately protective. The Service expects that the proposed permit and SIZs cannot be implemented without causing significant adverse impacts to sediments and native benthos.
- (Pages 3-30, 3-31, 3-33). "The degree of toxicity of carbaryl to marine vegetation varies considerably (WDF and ECY 1985). Some marine plants and algae are growth-inhibited by carbaryl, while others are not affected." "Imidacloprid ... is taken up ... by plants and is present in the foliage of plants. However, this is based on limited information regarding ... marine vegetation." "No studies were available to assess the toxicity of imidacloprid to marine algae." COMMENT - Imidacloprid treatments would overlap significantly with native eelgrass and would expose phytoplankton. If there is little or no information to assess potential effects to these important resources, we do not agree that a finding of no significant adverse impact can be justified for plants.
- (Page 3-31). "While imidacloprid would be applied to areas with high populations of burrowing shrimp on commercial shellfish beds only, research indicates that imidacloprid can move off-site rapidly in surface water and can be detected at least 480 meters (1,575 feet) away from the application site." COMMENT - These findings clearly indicate that effects and damages will not be limited to the treatment sites. Neighboring owners will have their tidelands exposed and affected even if they choose to avoid the practice of using chemical control methods for burrowing shrimp.

- (Pages 3-37). “Bull trout (*Salvelinus confluentus*) rarely occur in Pacific Coast drainages of Washington.” COMMENT - This statement is incorrect. Several coastal drainages to the north, including the Quinault, Queets, and Hoh River, support local populations and spawning of anadromous bull trout. Bull trout occur regularly in Grays Harbor and its lower tributaries. They have been documented in Willapa Bay and its tributaries, though infrequently and in low numbers. These represent the southernmost populations of anadromous bull trout found anywhere in North America, and the species is listed as threatened under the Endangered Species Act (ESA).
 - (Pages 3-43). “Based on the infrequent reports of bull trout in Willapa Bay and the Willapa River ... there is a low likelihood of bull trout being present within the commercial shellfish aquaculture project area (Berg 2002).” COMMENT - We agree that bull trout occurrence in Willapa Bay is infrequent and they may be present there in only very low numbers. However, it would be incorrect to state that bull trout are unlikely to use habitats on commercial shellfish beds. Bull trout forage and migrate along the nearshore (generally in water less than 10 meters deep) and are opportunistic foragers, often traveling great distances to access and take advantage of seasonally abundant food resources. Anadromous bull trout feed on marine forage fish and juvenile salmonids. Eelgrass meadows and other complex nearshore marine and estuarine habitats are a focal point for their foraging activities and provide essential prey resources.
 - (Pages 3-45, 3-46). “Nesting snowy plovers (*Charadrius alexandrinus nivosus*) occur in the vicinity of Willapa Bay on beaches fronting the Pacific Ocean from Grayland to the middle of the North Beach Peninsula. With the exception of Graveyard Spit, which is located at the mouth of Willapa Bay, there are no records of snowy plovers foraging or nesting in the bay or along the eastern shore of the North Beach Peninsula. Although there are a few isolated reports of snowy plovers foraging or sheltering from winter storms on the northern tip of Leadbetter Point, use of the area along the eastern tip of the peninsula is very limited. Snowy plovers also nest and forage along Damon Point, at the mouth of Grays Harbor. Although there are historic records of snowy plovers using the coastal beaches at Westport (south side of Grays Harbor), this area is no longer occupied (USFWS, March 24, 2009).” COMMENT - Grays Harbor and Willapa Bay support the only known populations of the western snowy plover in the State of Washington. Several beaches and sandy spits located in Grays Harbor and Willapa Bay are currently, or were recently, used by nesting western snowy plovers and are designated as critical habitat for the species. While nesting currently occurs at only a few locations, suitable foraging habitats extend over a larger area and include sand and mudflats, sand islands, and open beaches. Western snowy plovers forage along the wrack line for small surf-cast marine invertebrates. Suitable foraging habitats, including areas within the proposed SIZs for Willapa Bay and Grays Harbor, are considered essential for recovery of the species. Graveyard Spit and Leadbetter Point are currently the most productive breeding sites in Washington, and any impacts to prey resources (marine macroinvertebrates, including small crustaceans, mollusks, and worms) could have significant adverse effects to the population of western snowy plovers in Washington.
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- (Page 3-49). “Alternative 3 (Imidacloprid Applications with IPM) would provide adequate burrowing shrimp control ... with potentially reduced environmental side effects, compared to carbaryl. Imidacloprid would be unlikely to adversely affect polychaete worms or molluscs (bivalves, snails), including oysters and clams (Hart Crowser 2013; Grue and Grassley 2013; CSI 2013). A potential exception is imidacloprid effects in sediments high in organic matter. The limited information available for such sediments suggests adverse effects to polychaete worms and crustaceans (see Draft EIS Chapter 2, Section 2.8.3.5). A study of imidacloprid effects in high organic soils is expected during the summer of 2015. Results from this trial may result in adjustments to permit conditions during the five-year term of the permit.”
COMMENT - Ecology should not advance a permit decision until more data is collected (during 2014 and 2015) and shared with the public. A decision to issue the permit and authorize SIZs while relevant and important data remain unavailable would be premature. Ecology should not advance the permit decision until they have fully addressed and can be responsive to legitimate scientific concerns regarding fate and transport, efficacy, persistence, and effects to non-target organisms, including several species listed under the ESA and their designated critical habitats. We recommend to Ecology that they should continue limited field trials under the Experimental Use Permit.

Specific Comments for the Draft Permit

- (Page 5). The threshold criterion for “minor” adverse effects to sediments and benthos are not adequately protective. They are not adequately protective of the natural ecosystems in Willapa Bay and Grays Harbor, or the ESA-listed species that occur there. The Service expects that the proposed permit and SIZs cannot be implemented without causing significant adverse impacts to sediments and native benthos, including prey resources on which several listed species depend. Ecology and the WGHOGA acknowledge that there are a number of outstanding issues and concerns regarding fate and transport, efficacy, persistence, and effects to non-target organisms (Ecology 2014, pp. 1-33 through 1-37). Therefore, the Service opposes the authorization of SIZs in Willapa Bay and Grays Harbor.
- (Page 6). “This permit does not convey property rights of any sort, or any exclusive privileges, nor does it authorize any injury to private property or any invasion of personal rights.” COMMENT - Imidacloprid can move off-site rapidly and might be detected at a distance of 1,000 or 2,000 feet from the application sites. This fact illustrates that effects and damages will not be limited to the treatment sites. Neighboring owners will have their tidelands exposed and affected even if they choose to avoid the practice of using pesticides to control burrowing shrimp.
- (Page 6). The draft permit identifies and proposes to use the following action threshold: “No oyster or clam bed may be treated with imidacloprid unless the mean burrow count exceeds the determined action threshold of ten burrows per square meter ... If the mean burrow count is less ... a bed may be treated ... provided [that] a justification is approved by Ecology.” COMMENT - The documentation prepared by Ecology and the WGHOGA provides little information to describe where this threshold originated, who

developed the threshold, and how it is justified. The damage threshold is presented as a given and there is no effort to evaluate whether it is valid and appropriate for its intended purpose. In this sense, the proposed IPM methodology is arbitrary. Ecology has acknowledged that a well-defined method for determining the treatment threshold has not yet been formulated.

- (Page 7). The draft permit proposes inadequate treatment buffers. Imidacloprid can move off-site rapidly and might be detected at a distance of 1,000 or 2,000 feet from the application sites.
- (Page 9). “Minor effects, or the maximum allowable biological effects within the SIZ ... are exceeded if ... any one of the following ecological metrics is reduced by more than 50 percent, 14 days after imidacloprid application ... Class Polychaeta abundance and richness, Phylum Mollusca abundance and richness, and Class Crustacea abundance and richness.” COMMENT - The threshold criterion for “minor” adverse effects to sediments and benthos are not adequately protective. The Service expects that the proposed permit and SIZs cannot be implemented without causing significant adverse impacts to sediments and native benthos, including prey resources on which several listed species depend. We oppose the authorization of SIZs in Willapa Bay and Grays Harbor.
- (Page 21). “Nothing in this permit excuses a Permittee from compliance with any applicable federal, state, or local statutes, ordinances, or regulations.” COMMENT - There has been no consultation under the ESA addressing the effects of aquatic application of imidacloprid, and there is no valid, current ESA coverage for the application of imidacloprid to control burrowing shrimp. To date, no federal action agency has requested consultation with the Services to address the practice and its potential effects to listed species. Without a valid, current incidental take permit or statement addressing the effects of this practice on listed species, parties engaging in aquatic application of imidacloprid lack ESA coverage.

Specific Comments for the SIZ Applications and Notices

- (SIZ Notice, Page 2). The threshold criterion for “minor” adverse effects to sediments and benthos are not adequately protective. The Service expects that the proposed permit and SIZs cannot be implemented without causing significant adverse impacts to sediments and native benthos, including prey resources on which several listed species depend. Therefore, we oppose the authorization of SIZs in Willapa Bay and Grays Harbor.
- (SIZ Notice, Page 2). “The names and addresses of other landowners affected by the proposed SIZ are listed in Attachment B.” COMMENT - Attachment B fails to identify the U.S. Department of the Interior, U.S. Fish and Wildlife Service, as a landowner. The proposed SIZ for Willapa Bay extends onto tidelands located within the Leadbetter Point Unit of the Willapa National Wildlife Refuge (U.S. Fish and Wildlife Service 2011, pp. 2-57 through 2-61), and the SIZ for Grays Harbor extends into the Grays Harbor National Wildlife Refuge at Bowerman Basin. If Ecology issues the proposed permit and

authorizes the proposed SIZs, we expect that there will be negative direct and indirect effects to the Service's trust resources. We do not support the issuance of an individual NPDES permit at this time and we oppose the authorization of SIZs in Willapa Bay and Grays Harbor, especially in light of the potential for adverse effects to several listed species.

- (SIZ Application, Pages 5, 11). "Limited toxicity data are available to quantify the toxicity of degradation products or metabolites, as the majority of studies have focused on the parent compound imidacloprid ... Several studies conducted on insects found ... only the olefin derivative, which occurs as a metabolite in treated plants, has toxicity comparable to imidacloprid (Nauen *et al.* 1998; Suchail *et al.* 2001; Kagabu *et al.* 2004; SERA 2005; EFSA 2006; Tomalski *et al.* 2010)." "Seven out of 20 eelgrass samples had detectable concentrations of imidacloprid on the first day post-treatment." COMMENT - We can expect that detectable concentrations of imidacloprid and/or olefin will be present in eelgrass located both on and off of the treatment sites. Eelgrass will, in turn, represent a potentially significant exposure pathway for a variety of wildlife species, including waterfowl.
- (SIZ Application, Page 16). All Known, Available, and Reasonable Methods of Prevention, Control, and Treatment (AKART). COMMENT - With our previous letter to Ecology (Letter to Donald A. Seeberger, dated February 14, 2014), the Service recommended that the EIS and permit framework should give fair and equal consideration to alternate culturing methods and practices. Control and removal of a native species that performs important ecological functions should not be the primary objective. Instead, this effort should be directed at developing and refining robust IPM methodologies, with stricter limits on the use of chemical control agents and an emphasis on adaptively managing shellfish production systems to avoid harming ecological resources. Graveling and frosting are established practices with the specific goal of firming substrates and fostering good conditions for larval attachment, maturity, and growth. Graveling and frosting should have a role in IPM methodologies directed at successful shellfish culturing on tidelands affected by burrowing shrimp. Long-line and stake culturing are also established practices, and are used successfully by some growers and farm operators in these same portions of Willapa Bay and Grays Harbor. Much of the information used to discredit these practices appears to be anecdotal and not based on either scientific studies or rigorous and comparative evaluation. Ecology and the WGHOGA should address more seriously and objectively whether methods of ground-based culturing and production require reevaluation in light of new science and the many concerns related to aquatic pesticide applications. Chemical control methods with lethal and biologically significant sub-lethal effects to non-target organisms should be a last resort and only implemented after a robust IPM methodology has exhausted all other alternatives at each specific location.
- (SIZ Application, Page 18). Ecology and the WGHOGA acknowledge that burrowing shrimp numbers and densities exhibit cyclical changes over time. There is little or no evidence to substantiate the claims that Willapa Bay and Grays Harbor are currently


experiencing anything unusual related to burrowing shrimp recruitment, numbers, abundance, and densities.

Specific Comments for the Fact Sheet

- (Pages 37, 38). “Dungeness crab and fish were counted on the day of application and again 24 hours after treatment ... The average across all sites and treatments was two affected crab per acre ... The highest count was 3.4 affected crab per acre ... Bird predation of [paralyzed] crab ... appeared to be the main cause of crab mortality.” “Birds were observed foraging on and nearby the sites following treatments.” COMMENT - Willapa Bay and Grays Harbor support vitally important migratory and resident bird populations. If Ecology decides to issue the proposed permit, we expect that these waterfowl, raptor, and shorebird populations will be exposed to imidacloprid and its degradation products both on and off the treated sites. Birds that forage on the exposed tidelands will encounter and may ingest the granular pesticide product directly. Birds that forage on the exposed tidelands are also likely to ingest contaminated vegetation, sediments, and/or prey items. The western snowy plover, which is listed as threatened and uses sand and mudflats, sand islands, sand spits, and open beaches located in Grays Harbor and Willapa Bay, is likely to be exposed and affected.
- (Pages 56-58). There has been no consultation under the ESA addressing aquatic application of imidacloprid, and there is no valid, current ESA coverage for the application of imidacloprid to control burrowing shrimp. To date, no federal action agency has requested consultation with the Services to address the practice and its potential effects to listed species. Without a valid, current incidental take permit or statement addressing the effects of this practice on listed species, parties engaging in aquatic application of imidacloprid lack ESA coverage.
- (Page 59). “Monitoring data will characterize the spatial extent, fate, and transport of imidacloprid following application, and help to determine if concentration are a concern for non-target organisms.” COMMENT - Ecology, the WGHOGA, and their research partners acknowledge that the limited field trials performed to date have failed to meaningfully and adequately address a number of outstanding issues and concerns regarding fate and transport, efficacy, persistence, and effects to non-target organisms (Ecology 2014, pp. 1-33 through 1-37). Ecology should not advance a permit decision until more data is collected (during 2014 and 2015) and shared with the public. A decision to issue the permit and authorize SIZs while relevant and important data remain unavailable would be premature. Until field trials have adequately addressed the many unresolved questions, and to the satisfaction of all interested stakeholders, Ecology should not advance the permit decision. We recommend that Ecology should instead continue limited field trials under the Experimental Use Permit. We do not support the issuance of an individual NPDES permit at this time and we oppose the authorization of SIZs in Willapa Bay and Grays Harbor. The Service acknowledges that continuing a program of limited field trials would improve the state of our knowledge regarding imidacloprid applications and effects in the estuarine and marine environments.

We appreciate the opportunity to comment and express our concerns regarding this proposal. If you or your staff have any questions, if our comments require further explanation, or you would like to discuss the Aquatic Pesticide Permits program, please contact Ryan McReynolds (ryan_mcreynolds@fws.gov; 360.753.6047), or Martha Jensen (martha_l_jensen@fws.gov; 360.753.9000).

Sincerely,

A handwritten signature in black ink, appearing to read "Thomas L. McDowell". The signature is fluid and cursive, with the first name "Thomas" being the most prominent.

Thomas L. McDowell, Acting Manager
Washington Fish and Wildlife Office

cc:

Willapa NWR, Ilwaco, WA (J. Ferrier)
Grays Harbor NWR, Hoquiam, WA (G. Nakai)
Ecology, Lacey, WA (J. Landskron)
Ecology, Lacey, WA (B. Rogowski)
NMFS, Lacey, WA (S. Anderson)
NMFS, Lacey, WA (T. Hooper)
WDNR, Olympia, WA (D. Palazzi)
WGHOGA, Ocean Park, WA (J. Moore)
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PERSONAL COMMUNICATIONS

D. Rockett (Washington State Department of Ecology), pers. comm., October 21, 2014.

T. Hooper (National Marine Fisheries Service), pers. comm., October 29, 2014.